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SCIENCE

FRIDAY, SEPTEMBER 16, 1887.

THE LATEST NEWS from Stanley is dated Yambuya Rapids on the Aruvimi River. This is the most eastern point that could be reached by steamers, and here the overland journey to the Mvutan Nsige was to begin. The expedition, which consisted of 612 men, left Stanley Pool on May 1, on the 'Henry Reed,' of the American Baptist Mission, with 131 men on board; the 'Stanley,' of the Kongo Free State, carrying 364 men, 500 loads of baggage and goods, nine riding asses and a herd of goats, and the 'Peace,' of the English Baptist Mission, with 117 men on board, and towing two boats. The 'Stanley' towed the hull of the steel steamer 'Florida,' which had been launched the day before. Two miles above Kinshassa the 'Peace' met with an accident, her rudder being broken, and she had to return to Leopoldville for repairs. After this accident the expedition travelled steadily on; but the 'Peace' proved to be very slow, and was unable to keep up with the other steamers. A short distance below Bolobo another accident befell the expedition. The 'Stanley' struck a reef, and one of her sections was completely wrecked. Fortunately she could be restored to use by patching plates underneath. In order to make up for the time lost, Major Barttelot marched overland from Wamboko River to Kwamouth, and his party was afterward brought up to Bolobo by the 'Stanley.' Meanwhile the engineer of the 'Peace' had resolved to screw down the upper safety-valve, and by this expedient enabled the 'Peace' to proceed at the same rate as the other steamers. The journey from Bolobo to the rapids of the Aruvimi was effected without any further delays or incidents. On June 18 this place was reached, and Stanley proceeded at once to build an intrenched camp, in which Major Barttelot is to remain. While Stanley's steamers ascended the Aruvimi, Tippo-Tip was conveyed on the 'Henry Reed' to Stanley Falls station, of which he is the chief. He was accompanied by 96 Zanzibari, and Major Barttelot, who had 40 Sudanese soldiers with him, commanded the steamer. It seems that Stanley was going to leave the Arabian trader at Stanley Falls, and proceed to the Mvutan Nsige alone. Barttelot was to return the day after his arrival at Stanley Falls, and to rejoin Stanley at Aruvimi Falls. The natives of Yambuya would not allow the expedition to land, but, on hearing the steam-whistles, fled into the woods. The next day a few returned, and were sent off with presents. Stanley hoped to gain their confidence within a short time. On June 20 the 'Stanley' left the Yambuya Falls, and arrived at Leopoldville on July 2. These are the latest letters from Stanley so far; but the cable informs us that he found the river navigable above the Yambuya Falls, and that he was able to proceed in boats. Probably the 'Henry Reed' brought this news to Leopoldville. It may be that the river proves to be navigable for a long distance, and in this case Stanley's march to the Mvutan Nsige will be greatly facilitated.

THE TRANSCONTINENTAL RAILROADS.¹

THE transcontinental railroads cross great plains, high mountains, lofty plateaus, and broad basins, and follow the courses of long rivers. Nowhere do we find objects of greater interest to the traveller, geographer, geologist, or the student of natural history, than along these lines of travel. The rivers that rise on the eastern slope of the Rocky Mountains pursue an uninterrupted and peaceful course from the foot-hills, across the great plains, to the valley of the Mississippi. The rivers that rise on the western slope en-

counter range after range of mountains, some higher than the Rockies, and find their way to the ocean over high falls, through deep cañons, or by forcing a way through mountain ranges. Here is the longest persistent range of mountains in the world, — broad plateaus elevated from 8,000 to 10,000 feet above the level of the sea. Here are deep basins, with mountains so closely surrounding them that the streams, unable to find a way to the ocean, sink into the desert. Here is the valley of the Colorado, running through cañons 3,000 to 4,000 feet high, over 200 miles long, and so deep that in some places the sunlight never reaches the bottom. The rain, instead of fertilizing the ground, washes from the rocks every particle of soil, and leaves the country a desolate wilderness, devoid of vegetable or animal life. Here are high snow-mountains, and at their base deep valleys, sunk below the level of the ocean. There are mountains, more beautiful than Mont Blanc or the Matterhorn, rising directly from base to summit, 14,000 feet in height, with glaciers exceeding in extent and beauty any in Europe. From the far north to the extreme south are mines of gold, silver, and copper, and vast deposits of coal, lead, and iron-ore. Here the student of natural history finds fossils in endless variety and number, from the toothed bird to the miniature horse. As a compensation for the want of trees on the mountains, the largest and finest forest-trees in the world are found at their base, on the Pacific coast. The millions of buffaloes which formerly roamed over the plains are all gone, but their places are supplied by countless herds of cattle and flocks of sheep. Such a land is worth visiting; and the description of the country through which the railroads run, and of the roads themselves, must be of interest.

The traveller from the Atlantic to the Pacific by either of the transcontinental railroads enters the great plains, soon after crossing the 95th degree of longitude, near Winnipeg on the north, Omaha and Kansas City in the middle latitudes, or San Antonio at the south. Then commences the ascent, steadily continued until the top of the Rocky Mountains is reached. The land rises, at first slowly, then on steeper grades, and yet so gradually that the passenger on the Union Pacific reaches an elevation of one mile before he has seen the mountains or realizes that he has attained any considerable elevation. From the foot-hills, over the mountains to the Pacific Ocean, each road follows a route having its own features, so striking and distinct that no general description is of any value. The chief objects of interest are the great plains, the rocky mountains, the deep basins, the ranges of mountains west of the Rockies, and the plateau of the Colorado River; while the railroads — the work of man — vie in interest with the natural wonders.

The Great Plains.

Looking from Denver towards the west, or, better yet, from almost any part of the great plains in Colorado within 50 miles of the Rocky Mountains, are seen the foot-hills, then the mountains, rising higher and higher until lost in the distant snow-caps. Looking towards the east are the green and grassy plains falling in gentle undulations, north, south, and east, as far as the eye can reach, and for hundreds of miles beyond. These are the great plains of America, bounded by the Rocky Mountains on the west, the Arctic Ocean on the north, the Gulf of Mexico on the south, the Missouri and Mississippi rivers on the east. The great plains reach their culminating point between Denver and Colorado Springs, — at the divide between the waters of the North Platte and Arkansas rivers. From this elevation of 7,000 feet they slope north-easterly into Wyoming and Canada, towards the Arctic Ocean, easterly to the Missouri River, and southerly into New Mexico. The land, only fairly watered on the east, becomes arid towards the foot-hills of the Rockies, and, though rich and fertile, cannot be cultivated without irrigation. The rivers grow larger towards their sources, as the rainfall on the plains is insufficient to supply the

¹ The unfinished portions of the roads are included in the accompanying map.